



118 ALASKA: Alaska Sea Grant helped protect coastal water quality

Activity Summary: In 2000, MAP began a partnership with the Alaska Native American Fish and Wildlife Society (ANAFWS), with funding from the Environmental Protection Agency (EPA), to conduct a water quality training program in rural Alaska. The goal of the program was to develop water quality monitoring projects that meet the strict scientific rigor of the EPA Quality Assurance Project Plan (QAPP) protocols. MAP developed the curriculum, taught 60 percent of the course content, served as a technical advisor on several QAPPs. ANAFWS funding of this training program ended in 2007. However, MAP began collaboration with the University of Alaska Anchorage's Environmental and Nature Resources Institute, and developed a recertification class. EPA has authorized this recertification program, which is now taught to technicians needing recertification. To date, three recertification workshops have been held, one each in Anchorage, Bethel, and Dillingham. Impact Statement: People participating in this training developed 18 EPA-approved Quality Assurance Project Plans for their region, and were thus able to receive funding to employ a local tribal environmental coordinator. Twenty-seven technicians have been recertified by MAP. These efforts established a first line of defense to detect future water quality issues. Participants are now actively engaged in questioning activities that may potentially affect water quality in their communities and regions, and are actively educating others in their communities about water quality issues. The data collected by these monitors provide a baseline for detecting and tracking future water quality changes that may result from human and natural change. [*wq train*]

947 ALASKA: Alaska Sea Grant increased awareness of paralytic shellfish poison and harmful algal blooms

Activity Summary: A decades long PSP awareness and education outreach effort has been successful in limiting PSP illnesses among Alaskans and visitors. During this reporting period, MAP held five workshops, two training sessions, and a presentation at the Alaska Health Summit. Impact Statement: During 2007, there was one reported PSP illness. This is the lowest level of illness recorded since formal testing began in 1973. Residents of Kodiak Island, where subsistence shellfish gathering has been culturally important, have largely avoided shellfish in large measure because of the education and outreach efforts conducted there. Activity Summary: MAP was a co-PI on a North Pacific Research Board funded project titled, Response and Intervention System for Climate Change Induced Paralytic Shellfish Poisoning (PSP) in Aleut Communities, PSP Monitoring and Outreach. During the two years of the project, nine community technicians were trained in the standard operational procedure for sampling, storing, testing, and shipping of shellfish samples. About 150 samples were tested from nine species of shellfish. Outreach included reports delivered to over 500 persons in 19 communities and progress posted on five Web sites. Impact Statement: This project extended the range of known PSP occurrence in shellfish ranging from King Cove, Alaska, to the Commander Islands, Russia. PSP values are now available for subsistence harvest shellfish species not previously tested. Communities received and were receptive to the information provided. A sustained monitoring program was established in King Cove. This monitoring program is significant because residence of this small community of 150 residents regularly ship their harvest to communities as far away as Seattle, and to an estimated 1,000 Native American shellfish consumers. In 2007, after detecting PSP in Bering Sea blue mussels and surf clams, King Cove voluntarily suspended shellfish shipments. [*hab dis wq fish train cli*]

1132 CALIFORNIA: California Beach Health

This project has already had important impacts for habitat monitoring on sandy beaches and for the involvement of a variety of stakeholders in management practices. The California Grunion is now considered a Species of Special Concern and the sandy beach is considered Essential Fish Habitat according to the Magnusen-Stevens Act, as interpreted by the National Marine Fisheries Service and the California Department of Fish and Game. Citizen scientists from coastal California have been trained and have provided extensive data for an understudied species, and their commitment has extended beyond this one species to a sense of stewardship for the coastal habitat. The National Marine Fisheries Service- Southwest Region, Habitat Conservation Division has funded Grunion Greeter monitoring efforts in 2008 and plans to continue the work in future years. New management practices are in place throughout the habitat range of the grunion as a result of this work. The PI has evaluated habitat concerns for numerous agencies including California Coastal Commission, National Marine Fisheries Service, California Department of Fish and Game, Los Angeles Beaches and Harbors, California State Parks, the Goleta Beach restoration for the County of Santa Barbara, and ocean outlets in the County of Orange. The data were used in the assessment of the effects of the Cosco Busan fuel spill in San Francisco Bay. Numerous environmental organizations including Surfrider Foundation, Heal The Bay – Santa Monica, Santa Barbara Channel Keepers, and the Audubon Society are involved in grunion studies. Aquariums including Cabrillo Marine Aquarium, Birch Aquarium at Scripps Institution of Oceanography, the Roundhouse Aquarium in Manhattan Beach, the Aquarium of the Pacific in Long Beach, and the Ty Warner Sea Center of the Santa Barbara Museum of Natural History have grunion displays and programs as part of their mission. Several State Parks have initiated new public programs for grunion runs at their sites, including San Elijo State Beach, Bolsa Chica State Beach, Doheny State Beach, and Crystal Cove State Beach. Based on the efforts of the Working Group for beach managers and field operators, we are initiating the formation of a nonprofit organization. The focus will be to develop and disseminate best practices for beach management to balance wildlife conservation and recreation. *[R/CZ-195 (mon end train)]*

1161 CALIFORNIA: Grunion as Indicator of Beach Health

R/CZ-195, A CASG scientist is using the spawning populations of California grunion as an indicator of beach health. Trained citizen volunteers (Grunion Greeters) count spawning grunion on beaches. Impacts: Information from this project has led to new beach grooming practices in many parts of California. This Sea Grant-funded method for assessing grunion populations is now used by two private consulting firms and Orange County. In addition, the Grunion Greeters Project was one of only a few programs nationwide to participate in the 2006 Wildlife Watch Weekend sponsored by the National Wildlife Federation. *[R/CZ-195 (train wq)]*

111 CONNECTICUT: Connecticut Sea Grant Fosters Aquatic Invasive Species (AIS) Awareness and Education

A series of educational resources and ten activities focused on the Atlantic Coast “Top Ten” AIS were completed for adaptation to the web and inclusion on the website: [www.sgnis.org/kids](http://www.sgnis.org/kids). The content of the “Nab the Aquatic Invader!” website, developed and maintained by IL-IN Sea Grant, is being expanded to include AIS from throughout the United States, through a collaboration of the IL-IN, CT, LA,

NY, and OR Sea Grant Programs. The new sections of the website are expected to go “live” the summer of 2008. “Nab the Aquatic Invader” workshops were hosted by CTSG and AIS-related resource materials were distributed to K-12 formal and informal educators in Connecticut participating in several workshops. Impact: • Students (grades 4-10) can locate information and complete self-directed activities relating to AIS found along the Atlantic Coast (as well as the Great Lakes, Gulf Coast, and West Coast) on the “Nab the Aquatic Invader” website. The web-based activities incorporate concepts of science, math, geography, music, writing, and history, to teach about AIS, their ecological and economic impacts, pathways of introduction, and control methods. • 66 fifth-grade students and their teachers investigated and identified live marine invasive species during UCONN Marine Sciences Day and learned of the pathways by which marine species travel. • 75 high school students and teachers from 23 Connecticut schools were trained to identify marine invasive species and their pathways and impacts as part of the Aquatics subject-area preparation for the 2008 Envirothon competition. • A 7th grade student from St. Lawrence School (West Haven CT) earned Honorable Mention for her 2008 science fair project on how invasive species affect Long Island Sound, using resources provided by CTSG. • 24 members of the general public attending Cornucopia festivities sponsored by the UCONN College of Agriculture & Natural Resources learned about marine invasive species and their impacts, and observed/handled various live specimens. • 92 formal and informal educators obtained AIS-related resource materials produced by CTSG in 2007-2008, as part of their participation in CTSG workshops or by direct request. • Five (5) Connecticut-based marine education organizations distributed CTSG’s AIS-related materials to teachers participating in their programs, expanding the reach of CTSG-generated resource materials. [*inv edu train*]

#### 24 HAWAII: Sea Grant supports a volunteer coral reef monitoring program

In its ninth year of existence, the ReefWatcher monitoring program established by Hawaii Sea Grant trains volunteers to count fish and invertebrates in selected reef locations around the island of Hawaii. The goal of this program is to collect baseline data from selected monitoring sites continuously over the years. Impact: Since 2006, over 185 citizens have participated in ReefWatcher training. Data from this volunteer corp has been gathered for 16 sites, some for as long as seven years or more. Six years of ReefWatcher data has been converted from Microsoft Excel to Access database format by Hawaii Sea Grant to compliment the data management format used by the State Division of Aquatic Resources (DAR). Data collected by ReefWatcher volunteers over time has reflected trends similar to those documented by DAR scientists and, in addition, provide new data from nearshore areas not normally surveyed by the state, including intertidal and snorkel depth areas. [*mon prot train*]

#### 8 LAKE CHAMPLAIN: Sea Grant provides supports rain garden installation by citizens, municipalities and businesses in Vermont.

Focus Area: HEALTHY COASTAL ECOSYSTEMS NOAA SG Goal - Sound scientific information to support ecosystem-based approaches to managing the coastal environment LCSG Goal - Provide science-based information that will promote a healthy and diverse ecosystem and provide for sustainable human use and enjoyment of Lake Champlain, the basin and surrounding waters. Objective - Local residents and communities (including youth) act to protect and restore coastal, aquatic and watershed resources in the basin as a result of increased awareness of threats from NPS pollution (including phosphorus, toxins and bacteria), invasive species, and other water-related human health hazards. Sea Grant provides

supports rain garden installation by citizens, municipalities and businesses in Vermont. Working with a large number of partners, LCSG assisted homeowners, municipalities, schools and businesses with the siting, design and installation of rain gardens through a number of projects, including Vermont's Rooftop to Rivers Rain Garden Contest, St Albans LID Demonstrations, and Mid-Winooski River Watershed Urban Restoration Project. The LCSG Water Quality Specialist assisted in the installation of over 40 rain gardens by over thirty homeowners, on six properties in four municipalities, at three businesses, and at four condo associations. In addition, the St Albans Roadside Rain Garden project, with the Northwest Regional Planning Commission, the City of St Albans, Vermont Youth Conservation Corp and Bishop Street Residents, led to the installation of six curb-side rain gardens by the city that eliminated local stormwater flooding problems as well as reduced storm water volume discharging to impaired surface waters. [A/M-1 (ebm train wq wq)]

545 LAKE CHAMPLAIN: Sea Grant rain garden education and demonstration projects improve water quality in VT urban areas

Statement: LCSG's Winooski Rain Garden Project trained city staff and led the city to adopt rain gardens and rain barrels on municipal property throughout the small (1 mi<sup>2</sup>) , heavily urban former mill town. Impact: Measurements made at stormwater outlets after various levels of rainfall showed a significant reduction in stormwater volume discharging to Morehouse Brook, a stormwater impaired stream. Reductions in volume discharged ranged from over 70% in ½ inch rainfall to nearly 30 % in a 3 inch rainfall. [ (wq train)]

1313 LAKE CHAMPLAIN: Sea grant helps municipal officials and engineers in northern New England use Low Impact Development planning, site design and stormwater management practices.

Focus Area: HEALTHY COASTAL ECOSYSTEMS NOAA SG Goal – Sound scientific information to support ecosystem-based approaches to managing the coastal environment LCSG Goal – Provide science-based information that will promote a healthy and diverse ecosystem and provide for sustainable human use and enjoyment of Lake Champlain, the basin and surrounding waters. Objective - Local residents and communities (including youth) act to protect and restore coastal, aquatic and watershed resources in the basin as a result of increased awareness of threats from NPS pollution (including phosphorus, toxins and bacteria), invasive species, and other water-related human health hazards Sea grant helps municipal officials and engineers in northern New England use Low Impact Development planning, site design and stormwater management practices. LCSG, in partnership with University of Maine Cooperative Extension, Maine NEMO, University of New Hampshire Cooperative Extension and USA EPA, presented four Weathering the Storm: Managing Stormwater with Low Impact Development (LID) in Northern New England conferences in the region. Over 100 municipal officials attended individual conferences. Post conference evaluation showed that participants' knowledge about specific actions to take to improve stormwater management increased by 64%, and participants' knowledge of LID options, performance, application, costs, and benefits increased by 65%. As a result of the knowledge gained conference, IBM in Burlington, VT installed a large rain garden to treat storm water from a 1-acre parking lot. The town of Woodstock VT modified its zoning regulations to specifically include a LID ordinance. [A/M-1 (wq train)]

1322 MAINE: Scientific survey protocol for monitoring marine invasive species is implemented by the Maine Department of Marine Resources

In the fall of 2006, divers from the Maine Department of Marine Resources (DMR) participated in Maine Sea Grant's effort to develop a scientific survey protocol for monitoring marine invasive species in nearshore waters of the Gulf of Maine. This effort was successful and, in May of 2007, the DMR incorporated the protocol metric for a high priority species of invasive colonial tunicate (*Didemnum* sp.) into their annual sea urchin surveys. The urchin surveys include over 7500 data points from transects conducted along the entire coast of Maine. The DMR intends to continue collecting this data in 2008, and Maine Sea Grant is currently working with the Maine Marine Invasive Species Working Group to arrange for volunteer divers to conduct comparative transects at the same locations during the fall, when populations of invasive tunicates are typically highest. [A/EXT-03-02 (*inv mon train*)]

27 MICHIGAN: Summer Discovery Cruises Provide Opportunity to Experience Great Lakes

A total of 1,169 people from 17 Michigan counties and nine other states broadened their knowledge of the Great Lakes aboard Summer Discovery Cruises conducted by Michigan Sea Grant and its Metropark partners. Staff conducted 44 cruises in 2007 on Lake St. Clair and the lower Detroit River. Post-cruise evaluations reveal that following participation, 85 percent of returning participants felt a greater responsibility for the Great Lakes, 61 percent sought more information, 59 percent visited coastal Metroparks more often than before, and 35 percent engaged in new Great Lakes stewardship activities. Since 2002, more than 3,900 people have participated in 149 Summer Discovery Cruises. [ (*train*)]

119 MICHIGAN: Sea Grant Helps Baitfish Industry Cope with Deadly Fish Virus

In partnership with the Michigan Baitfish Association, Sea Grant developed model AIS-HACCP and biosecurity plans tailored to baitfish operations to prevent the spread of aquatic invasive species, notably Viral Hemorrhagic Septicemia (VHS). Since 2005, VHS has caused fish kills in the Michigan waters of northern Lake Huron, Lake St. Clair and the St. Clair River, and Lake Erie. Through Sea Grant workshops, 60 Michigan baitfish wholesalers and retailers were trained in AIS-HACCP procedures, allowing them to become certified as disease-free facilities by the U.S. Department of Agriculture's Animal and Plant Health Inspection Service, and to remain in operation. Certified VHS-free minnows are now widely available in Michigan bait shops. Further broadening program impact, Michigan Sea Grant presented the model AIS-HACCP and biosecurity plans to HACCP trainers in Wisconsin, Minnesota and South Dakota. [ (*inv fish dis train*)]

571 MINNESOTA: Sea Grant Helps Coastal Communities Balance Development and Environmental Concerns

Sea Grant helped to review permit requests for city and tax forfeit land parcels for suitability for development in relation to environmental concerns and create the Lakewood Township Comprehensive Plan. Five communities within the Lake Superior Watershed relied on Sea Grant community planning advice to guide ordinances and planning with respect to water quality and natural resource protection.

Using Sea Grant materials and expertise, Minnesota's Woodland Advisers are offering hands-on sediment and erosion control workshops for forest land owners. Cook County officials were able to publicize, coordinate, and facilitate public meetings for the Poplar River Total Maximum Daily Load (TMDL) study, and offer data about the Poplar River (an impaired river) online in an accessible way. These actions collectively help the policy makers, planners, and the public to understand how they affect community planning, stormwater management, and Lake Superior's water quality. *[A/CC-2 (wq train)]*

409 MISSISSIPPI/ALABAMA: Sea Grant Nature Tourism Initiative teaches dolphin cruise operators sustainable viewing practices

Dolphin viewing tours on Alabama's Gulf Coast are the largest sector of the nature tourism industry in Baldwin and Mobile County. Approximately 100,000 tourists pay for these excursions annually. The Nature Tourism Initiative, in partnership with NOAA's Office of National Marine Sanctuaries and NMFS, the Whale and Dolphin Conservation Society and the Dolphin Ecology Project trained 21 dolphin tour operators to promote responsible stewardship of wild dolphins in coastal waterways through the Dolphin SMART program. One recognized Dolphin SMART tour operator has reported teaching 15,000 Gulf Coast tourists sustainable viewing practices. *[A/O-1 (end train)]*

478 NEW YORK: New York Sea Grant: Helping marinas help themselves (and save money)

New York's recreational boating industry generates billions of dollars in revenue. NY's marinas, struggling to contain costs, must also comply with regulations such as the 2007 revised permit program, Storm Water Discharges Associated with Industrial Activities. NYSG and partner, NY Marine Trades Association (NYMTA), held a workshop for marina operators, many of whom did not know about regulatory changes or the required Storm Water Pollution Prevention Plan (SWPPP). NYSG developed materials on the permit program used at training courses and created a readily useable template for a model marina SWPPP, and posted it to NYSG's Marina Pollution Prevention Web site (where downloaded 970 times). NYMTA reported 57 percent of its 61 members used the template to develop their own SWPPPs and saved consultants fees (\$3,500 to \$5,000), thus saving a total between \$108,500 and \$155,000. If the same percentage of marinas in the total population of 450 marinas in downstate NY used this material, savings would be between \$0.9 million and \$1.3 million for the recreational boating industry. *[A/EEP-33 (train wq)]*

576 NEW YORK: With Sea Grant management, dune and river stewards increase public awareness of Lake Ontario resources

Using three strategies, the Eastern Lake Ontario Dune/Salmon River Steward Program effectively educates the public about NY's natural resources and the responsible use of publicly-accessible waterfront properties that boast rare and unique dune and wetland habitats. Each steward (undergrad or graduate student), in addition to monitoring assigned areas daily, developed a newspaper/media article, public education program, and project benefits summary. Their programs on the proper use, stewardship and protection of the fragile dunes area and the Salmon River corridor of Eastern Lake Ontario were attended by local groups: environmental, Americans with Disabilities and natural resource

“Friends” groups, youth, seniors, and shoreline property owners. Program topics were: invasive species (round goby, water chestnut, emerald ash borer); water flow and “critters” of the lake and river. Local, regional and state print, TV and radio announced steward programs or featured articles. The Steward program trains future leaders and provides program partners with a valuable resource; it is managed by NYSG and partners NYS Dept of Environmental Conservation (NYSDEC), NYS Office of Parks, Recreation & Historic Preservation, and The Nature Conservancy. *[A/EEP-33 (inv train edu)]*

#### 1414 NEW YORK: Sea Grant researchers establish a regional laboratory to monitor algal toxins in water bodies

Cyanobacterial blooms and their associated toxins have caused environmental and human health problems worldwide. To investigate the occurrence of anatoxin-a in the lower Great Lakes, nearly 1500 water samples were collected from Lakes Ontario, Erie and Champlain between 2001 and 2004, and the anatoxin-a content determined using HPLC after fluorometric derivatization. Anatoxin-a was found in 2% of the samples from Lake Ontario, 5% of the samples from Lake Erie, and 4% of the samples from Lake Champlain. Overall the anatoxin-a concentrations were low (less than 0.01 micrograms per liter), with the highest concentrations observed in Lake Champlain (6.3 micrograms per liter) and Lake Ontario (1.4 micrograms per liter). Few samples had anatoxin-a concentrations that exceeded 0.5 micrograms per liter, suggesting that despite the highly publicized animal fatalities in Lake Champlain; acute toxicity from the neurotoxic anatoxin-a is likely to be rare. Anatoxin-a was relatively unstable (half-life ~5hr) in natural waters when exposed to UV light and higher pH levels (>8) similar to those which occur during a cyanobacterial bloom. IMPACT: Instability of anatoxin-a has important implications for management because samples collected in the later stages of a bloom may underestimate the actual risk from this toxin. Thus to facilitate monitoring, the researchers established a regional monitoring laboratory for anatoxin-a, offered training workshops for outside agencies in measuring anatoxin-a, and worked to develop a rapid monitoring technique for this neurotoxin. They have developed a prototype two-step Enzyme-Linked Immunosorbent Assay (ELISA) for this toxin which is sensitive to 0.6 micrograms per liter. This new ELISA shows good correlation ( $R^2 = 0.96$ ) with the fluorometric HPLC method when both were used to analyze natural field samples for anatoxin-a. The lead researcher is currently working with several different biotechnology firms to investigate new coupling techniques for formation of additional antibodies against anatoxin-a. *[R/XO-2 (train mon hab)]*

#### 496 OREGON: Protecting and Conserving Oregon Groundwater Supplies through “Citizen Science”

The Oregon Water Resources Department (OWRD) in the Natural Resources Office has a vested interest in protecting and conserving Oregon groundwater supplies. The OWRD, in collaboration with Oregon Sea Grant, supported the establishment of a fellow who would develop a groundwater-level monitoring program, including the development of all training, promotional, and outreach materials; the program’s Web site; and the evaluation of this pilot program. Abigail Brown, an Oregon State University (OSU) master’s student in water resources policy and management, led this collaborative pilot project in the Eola Hills groundwater limited area, under the precept of engaging citizens in research and collection of scientific data (“citizen science”). Twenty-six people were trained to measure the water levels in their wells at Neighborhood Groundwater Network (NGWN) workshops. Eleven of the resulting water-level measurements were entered into the OWRD online database. In this leading example of citizen science, the training materials and program design developed through this Oregon Sea Grant fellowship are



already being adopted in both Benton County and the Yamhill County Soil and Water Conservation District. It is clear there is widespread interest in understanding, protecting, and measuring groundwater supplies across Oregon. An impromptu review of community groundwater-level monitoring programs across the United States indicates that such programs are rare. These types of projects could be implemented by a variety of organizations, including watershed councils, soil and water conservation districts, counties, and schools. *[ (mon train wq)]*

#### 1478 OREGON: Invasive Specie Awareness

It is still too early to assess impacts from this project. However, there are at least two results that are already leading towards measurable outcomes and impacts. This list will expand when the graduate student projects are completed. Although the publication on “How to Prevent the Spread of New Zealand Mudsnailes” was completed in late June 2006, we have already received: 1) written memos from users that this publication has made them aware of AIS and AIS issues that were previously unknown to them; 2) A request for additional publications so they can alert colleagues and acquaintances about the problem and how to prevent AIS; 3) Requests from different organizations and agencies to adapt the publication to other regions. As a result of our initial trainings for marinas and ports and associated watershed groups, protocols are being adopted for awareness, inspection, and cleaning of boats and water gear before they enter water or move to other waterways. *[A/NIS-13-NSI-ANS (train edu inv)]*

#### 1484 PENNSYLVANIA: Improving AIS Management in Pennsylvania

PASG took a leadership role to develop an aquatic invasive species management plan for Pennsylvania which was signed by Governor Rendell in December 2006 and approved by the federal ANS Task Force in February 2007. Educating natural resource professionals about AIS prevention techniques: Participants in workshops facilitated by the USFWS and PASG were introduced to the HACCP process to prevent the spread of AIS. These workshops for fishery and conservation agencies helped in identifying control measures to prevent the spread of invasive species through their management and enforcement activities. The workshop resulted in the training of 65 participants who passed on the training and information to their staff and colleagues. The workshops translated into several management actions:

- PFBC now specifies fish capture equipment that is legal to use with brood stock in Edinboro Lake that had been invaded by zebra mussels.
- PFBC discontinued the practice of transferring emerald shiners from Lake Erie to inland waters in an effort to control the spread of invasive species and plan to limit steelhead production operations to the Lake Erie watershed to avoid the transfer of fish diseases to inland waters.
- 79 percent of HACCP participants said they would take the information from the workshop and make management changes within their agencies.
- Developed a curriculum and training and provided technical assistance to track and report Zebra and Quagga Mussels. Set a framework for monitoring additional species.
- Pennsylvania Sea Grant in collaboration with New York and Vermont Sea Grant, and Cornell College of Veterinary Medicine received funding from USDA to conduct two HACCP and VHS technology workshops in conjunction with the Northeastern Aquaculture Association.

*[A/ (dis train inv edu)]*

482 PUERTO RICO: Capacity building in coastal issues: Watershed Management

Watershed management: Land- Sea Alliance: introduction to Jobos Bay Estuary. A new initiative between JBNERR, UPR Sea Grant College Program (UPRSGCP), and the UPR Agricultural Extension Service (AES) to provide AES specialists and extension agents with tools and new information available on best management practices implemented in the reserve watershed. In the overall 100% of the participants increased their knowledge and scientific understanding in watershed management. They also were aware of collaborate and establish partnerships with UPR Sea Grant and JBNERR. A comment of this activity was: “This has been something wonderful. It has given me knowledge, educational material, and an interest that I don’t have before to take that knowledge to communities on my municipality. Thanks for an excellent collaboration and information transfer.” [M-151-3-06 (wq train)]

579 PUERTO RICO: Capacity building in coastal issues: Stormwater management

Stormwater management: NPDES Small Municipal Separate Storm Sewer System (MS4) General Permit Workshop in collaboration with the Puerto Rico Stormwater Office of EPA. These training activities provided to municipalities of Puerto Rico the requirements and process to develop a Storm Water Management Plan for small municipalities (Small MS4 General Permit). Up today 24 municipalities and nine campuses of the University Puerto Rico, including its Central Administration Offices submitted the MS4 General Permit with the Storm Water Management Plan. A total of 102 municipal officials, and coastal decision makers received formal training in MS4 General Permit completing a total of 627 training hours. [M-151-3-06 (wq train)]

1613 WASHINGTON: Sea Grant provides new professional development opportunities for shoreline and coastal planners

A collaborative project of Sea Grant and the state Department of Ecology, the Shoreline and Coastal Planners Group (SCPG) fosters communication among local governments and other relevant parties, provides a forum for discussion of policy concerns, new technologies, emerging issues and changing legislation and regulations, and improves implementation of the state's Shoreline Management Act, Growth Management Act and similar programs through field trips and discussion of best practices and lessons learned. Re-initiated after a three-year hiatus, the group has a new SCPG Web page and a 280-member list-serve. Impact: Planners at the city, county and state levels interact with each other while receiving science, policy and planning-oriented instruction from leaders and experienced professionals in their field. Improved understanding of ecosystem-oriented impacts of planning decisions will enable planners to make more robust, science-based decisions in their jobs when implementing planning and land-use regulations. All 38 participants in the inaugural meeting on urban shoreline restoration rated the meeting as useful and expressed satisfaction. [A/E/T-CCDP-1 (train ebm)]

937 WISCONSIN: HACCP Technique Helps Prevent Spread of Invasive Species to Fish Farms

Wisconsin Sea grant trained 30 participants in three Aquatic Invasive Species Hazard Analysis Critical Control Point (AIS HACCP) workshops this year. Participants included state hatchery staff and private fish

farm operators. Two private farms and two hatcheries developed AIS HACCP plans as a result. *[A/AS-1 (inv train)]*

1683 WOODS HOLE OCEANOGRAPHIC INST.: Sea Grant bridges gap between science and management

A partnership of the Woods Hole Sea Grant Program, Waquoit Bay National Estuarine Research Reserve and Massachusetts Coastal Zone Management, the Massachusetts Coastal Training Program (CTP), provides support, training and technical information to communities, organizations and agencies so they can better manage the coastal resources so vital to their economies and way of life. *[M/ (train ebm)]*

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related materials to teachers participating in their programs, expanding the reach of CTSG-generated resource materials. *[(inv edu train)]*

### 130 CONNECTICUT: Sea Grant fosters Habitat Based Management Planning among Land Stewards

Connecticut Sea Grant developed a habitat-based management plan outline as a new tool for land trust stewards and town open space managers to support the long-term conservation and management of open space in Connecticut. The outline provides a framework for the documentation of background information and a methodology to determine management actions, based on habitat, needed for the long term conservation of a particular site. More than 240 land trust and town commission members are now trained in the use of the tool and its application to the management of specific habitats. Following the training, three land trusts and one conservation commission have to date incorporated all or aspects of the outline into management plans for land parcels. The Essex (CT) land trust was awarded NRCS WHIP cost share funds to implement habitat management on one of its preserves. *[A/E-1 (ebm train)]*

### 471 CONNECTICUT: Sea Grant / NEMO training and tools used to modify regulations and plans in 20 towns

Sea Grant / NEMO programs for Connecticut coastal community decision-makers on land use impacts on water quality and coastal resources have trained more than 500 land use commissioners on land use planning principles and map and site plan review procedures, resulting in updated Community Plans in 10 towns, revised regulations to include water resource protection in eight towns, and the use of new development practices in five towns. In more than 20 towns, regulations and town plans have been changed to protect water quality. *[A/E-1 (wq train)]*

### 144 LAKE CHAMPLAIN: Sea Grant helps secondary school students in Vermont learn about water quality, NPS pollution, and aquatic ecology

Focus Area: HEALTHY COASTAL ECOSYSTEMS NOAA SG Goal- Widespread use of ecosystem-based approaches to managing land, water and living resources in coastal areas LCSG Goal - Ecosystem based approaches used to promote a healthy and diverse ecosystem and provide for sustainable human use and enjoyment of Lake Champlain, the basin and surrounding waters. Restore coastal and aquatic ecosystems in the Lake Champlain basin. Objective. Local residents and communities (including youth) act to protect and restore coastal, aquatic and watershed resources in the basin as a result of increased awareness of threats from NPS pollution (including phosphorus, toxins and bacteria), invasive species, and other water-related human health hazards. Objective. Provide effective education programs for pre-college youth on water quality, water resources and watershed issues important to sustainable use and management of Lake Champlain and basin water resources. Sea Grant helps secondary school students in Vermont learn about water quality, NPS pollution, and aquatic ecology. UVM Watershed Alliance offers lab, field, classroom, and research vessel based watershed and lake education programs to secondary school students in Vermont. During the reporting period, we reached over 1400 students from public, private, urban and rural schools throughout the Lake Champlain Basin. During the fall 2008 program season, approximately 240 7th and 8th grade students at Edmunds middle school in Burlington,

the largest urban area in Vermont, participated in WA watershed education programs. We held two classroom sessions on key watershed concepts and one field session to collect water quality data with 160 students, and 80 students received classroom instruction on NPS pollution and urban watersheds. Pre and post testing indicated a 38%, 14%\*, and 50% average increase in watershed knowledge for the respective classes. \*This number may be lower as a result of an essay question that was included in the post-test, but not the pre-test”the teacher did not feel the essay would be appropriate for the pre-test. As such, post-test grades may have been adversely impacted. [A/M-1 (train wq)]

#### 158 LAKE CHAMPLAIN: Sea Grant HACCP Training reaches new audiences

Statement: Lake Champlain partnered with USFWS, and Lake Champlain Basin Program staff to offer an AIS Hazard Analysis Critical Control Point (HACCP) training workshop in October 2007 (see: [http://www.haccp-nrm.org/HACCP\\_LCBP.pdf](http://www.haccp-nrm.org/HACCP_LCBP.pdf)). Workshop attendance included personnel from a variety of natural resource related state agencies in both New York and Vermont. Impact: Early in 2008, the New York State Office of Parks, Recreation and Historic Preservation’s Environmental Management Bureau completed a HACCP plan as a direct result of the staff participation in the workshop. This is a critically important management effort given that the agency’s Environmental Management Bureau conducts various forms of aquatic field work throughout “summer” months across the entire state. This field work typically involve travel to multiple water bodies (and sometimes multiple parks) throughout New York State within one day to: collect water quality data, monitor and sample aquatic plants including invasive species, sample for total phosphates and species of phytoplankton, mapping using GPS, and in some cases perform special studies and sanitary surveys of watersheds. [ (train inv train)]

#### 215 LAKE CHAMPLAIN: Sea Grant training increases law enforcement expertise relative to aquatic invasive species (AIS).

Statement: During the spring and summer of 2007, fifty three law enforcement officers (including VT State Police, NYSDEC Conservation Officers, and NYSDEC Forest Rangers) received training to assist them with various transport and possession regulations related to invasive species, during several workshops hosted jointly by VT/NY state agencies, Lake Champlain Basin Program and Lake Champlain Sea Grant. Impact: Ninety seven percent of the law enforcement personnel reported an increase in AIS identification skills as a direct result of training conducted by LCSG Specialist M. Malchoff. Ninety six percent of the VT State Police and 73% of the NYS DEC Conservation Officers indicated a 50% to 75% likelihood that they would implement this knowledge in the next 6-12 months. [ (train inv)]

#### 119 MICHIGAN: Sea Grant Helps Baitfish Industry Cope with Deadly Fish Virus

In partnership with the Michigan Baitfish Association, Sea Grant developed model AIS-HACCP and biosecurity plans tailored to baitfish operations to prevent the spread of aquatic invasive species, notably Viral Hemorrhagic Septicemia (VHS). Since 2005, VHS has caused fish kills in the Michigan waters of northern Lake Huron, Lake St. Clair and the St. Clair River, and Lake Erie. Through Sea Grant workshops, 60 Michigan baitfish wholesalers and retailers were trained in AIS-HACCP procedures, allowing them to become certified as disease-free facilities by the U.S. Department of Agriculture’s

Animal and Plant Health Inspection Service, and to remain in operation. Certified VHS-free minnows are now widely available in Michigan bait shops. Further broadening program impact, Michigan Sea Grant presented the model AIS-HACCP and biosecurity plans to HACCP trainers in Wisconsin, Minnesota and South Dakota. [*inv fish dis train*]

#### 150 MICHIGAN: Sea Grant Provides Planning Support for Michigan's Northeast Region

More than 50 partner organizations, state agencies, and three county governments collaborated on a two-year Sea Grant-led project to stimulate economic development and sustainability in Michigan's northeast region. In 2007, project research teams finalized five technical assessments characterizing the status of life in northeast Michigan, focusing on socioeconomic, ecological, cultural, planning and zoning, and sustainable design. The Northeast Michigan Integrated Assessment (NEMIA) has resulted in unprecedented regional collaboration. Notable outcomes include: 1) cooperation between the NOAA Thunder Bay National Marine Sanctuary and Michigan Department of Natural Resources to incorporate cultural interpretation into MDNR sites; 2) development of a regionally coordinated management plan for three coastal state parks with citizen input; 3) the collaborative capacity to apply for a People and Land (PAL) grant supported by the W K Kellogg Foundation; 4) selection of northeast Michigan by Michigan State University Extension as a pilot community for regional economic development; 5) successful state funding to enhance recreational opportunities for paddlers along northern Lake Huron; and 6) selection of the northeast region to receive funding from the Great Lakes Fishery Trust to support Great Lakes place-based education. In all, a total of \$195,000 was secured as a result of the NEMIA process, with \$70,000 pending. [*soc train prot res*]

#### 149 NEW YORK: Sea Grant workshop helps stakeholders understand Lake Ontario lower food web indicators

NYSG compiled information for using lower food web indicators to gauge Lake Ontario ecosystem health and sustainability. At a one-day workshop where top U.S. and Canadian scientists presented this information to the public, 50 attendees learned the effects of nutrient regulation on zooplankton, phytoplankton and fish communities, and how lower food web organisms may indicate ecosystem sustainability. Participants evaluated the workshop highly successful and the Ontario Ministry of Natural Resources (OMNR) requested NYSG develop a companion workshop for Canadian stakeholders in 2009. OMNR also recommended that this workshop template be adapted by the Lake Ontario Committee to present to the NY-Ontario public as part of the revision of Fish Community Objectives for Lake Ontario. NYSG information will be used as the Great Lakes Fisheries Commission develops a 'traffic-light' model to help stakeholders understand the links between ecosystem sustainability and the status of food web indicators. The model assigns a red color to indicators of serious ecosystem stress, yellow to indicators of moderate stress, and green to food web indicators of a healthy ecosystem. [*A/EEP-33 (ebm wq fish train)*]

#### 427 OHIO: Sea Grant assists the Ohio travel industry to protect Great Lakes water

Ohio Sea Grant provided input, guidance and training to Ohio's tourism industry and conservation agencies regarding the Great Lakes Compact. At the request of the conservation agencies, Huntley met

with 11 key legislators as a technical expert to provide information related to Lake Erie tourism and Great Lakes water. Impact: The Great Lakes Compact was passed in early-summer 2008 thus preventing unauthorized diversions of Great Lakes water. [ (wq train)]

#### 154 OREGON: Oregon Sea Grant Played a Critical Role in the Creation of Marine Reserves In Oregon

Governor Kulongoski's directive to the state Ocean Policy Advisory Council (OPAC) in 2006 for recommendations on marine reserves set in motion a concerted effort that, by late 2007, had reached an impasse. Oregon Sea Grant (OSG) was invited by OPAC to design, develop, and implement extensive "listening and learning" in coastal communities. After a series of coastal meetings with stakeholders, all the comments were shared publicly in late spring 2008 at <http://seagrant.oregonstate.edu/outreach/reserves.html#report>. OSG's report to the governor caused a major change in the process of developing marine reserves. That new process sought to marry scientific and experiential knowledge with a community-driven approach. The result of this process was the OPAC's identification of two pilot marine reserves and four other areas for further consideration. The 2009 Oregon Legislature approved this plan (HB 3013) and dedicated funding of \$1 million to it. The Oregon Department of Fish and Wildlife's chief of fisheries and the governor's representative on OPAC both commended OSG's pivotal role in the successful development of the state's first marine reserves within Oregon's Territorial Sea. [ (train prot)]

#### 1479 OREGON: Master Watershed Program Moves Beyond Oregon Borders

Oregon Sea Grant's Master Watershed Steward (MWS) program has been delivered to watershed groups and citizens interested in watershed enhancement for the past seven years. Many impacts have been recorded in relation to people conducting field projects: Teachers apply their watershed steward training in their classrooms where class projects improve their community watersheds; local government, citizen groups, and business leaders apply stewardship training in on-the-ground stream and wetland projects. Several report they have applied for and received grant funding to enhance their projects. Surveys were sent to states who purchased an MWS Learning Guides or requested information on how we organize and deliver our program. Seventeen surveys were completed from ten different states and Mexico; eleven indicated they have used the materials and have delivered some type of watershed related program. Three states have active watershed stewards programs based on Oregon materials and experiences: Arizona, North Carolina and Texas which are multiplying the efforts of success. [A/ESG-7 (edu edu train ebm wq)]

#### 137 TEXAS: Texas Sea Grant trains volunteers for red tide detection (2008)

Texas Sea Grant's Cameron County coastal and marine resources extension agent was one of the trainers for the Red Tide Rangers, a group of 32 volunteers organized out of the Rio Grande Valley Master Naturalist Chapter to monitor and collect samples in support of the Phytoplankton Monitoring Network, a national monitoring program that serves as an early detection program for hazardous algal blooms. During this reporting period, Red Tide Rangers detected large numbers of *Dynophysis*, a single cell organism responsible for causing diarrhetic shellfish poisoning related to shellfish consumption. The



Texas Department of State Health Services closed shellfish waters in Texas to avert consumption of shellfish contaminated with this organism. Periodic sampling and information for hazardous algal blooms helps avert unnecessary economic losses from tourists avoiding the area as a result of hazardous algal bloom 'hysteria.' A red tide scare in the 1990s coincided with a 10 percent drop in hotel/motel tax revenues on South Padre Island. During the reporting period, volunteers logged roughly 100 hours, which had an estimated market value of about \$1,800. Also, in addition to supporting the Hazardous Algal Bloom Workgroup in Texas, the samples and information collected by the volunteers in 2005 is also being used in a UT Brownsville study of the impact of the brevetoxin aerosol on inshore animals. The Red Tide Rangers project is being studied as a model for a statewide initiative. [A/F-1 (*hab train*)]

#### 138 TEXAS: Texas Sea Grant-trained volunteers detect harmful marine organism (2009)

Texas Sea Grant's Cameron County coastal and marine resources extension agent was one of the trainers for the Red Tide Rangers, a group of 32 volunteers organized out of the Rio Grande Valley Master Naturalist Chapter to monitor and collect samples in support of the Phytoplankton Monitoring Network, a national monitoring program that serves as an early detection program for hazardous algal blooms. During the reporting period, Red Tide Rangers volunteers detected large numbers of *Dynophysis*, a single-cell organism responsible for causing diarrhetic shellfish poisoning related to shellfish consumption. The Texas Department of State Health Services closed shellfish waters in Texas to avert consumption of shellfish contaminated with this organism. [A/F-1 (*hab train*)]

#### 139 TEXAS: Texas Sea Grant trains volunteers to monitor for harmful algal bloom (2009)

The Texas Sea Grant-trained Red Tide Rangers volunteer group regularly monitor the waters of the Lower Laguna Madre for *Karenia brevis* and other possibly harmful organisms. Periodic sampling and information for hazardous algal blooms helps avert unnecessary economic losses from tourists avoiding the area as a result of hazardous algal bloom "hysteria." A red tide scare in the 1990s coincided with a 10 percent drop in hotel/motel tax revenues on South Padre Island. In addition to supporting the Hazardous Algal Bloom Workgroup in Texas, the samples and information collected by the volunteers in 2005 is also being used in two UT Brownsville studies on the impact of the brevetoxin aerosol on inshore animals and brevetoxin's effects on cellular synapses. The Red Tide Rangers project is being studied as a model for a statewide initiative. [A/F-1 (*hab train*)]

#### 408 WISCONSIN: Sustainable Ports Workshop Leads to Environmental Assessment of Muskegon, Mich., Port

Wisconsin's water quality specialist co-chairs the Lake Michigan LaMP Forum, a multi-stakeholder group that facilitates implementation of the Lakewide Management Plan. She helped organize and chair a workshop on Sustainable Ports for the Lake Michigan LaMP Forum, held in Milwaukee on March 1-2, 2007. Wisconsin Sea Grant's Gene Clark and Minnesota Sea Grant's Dale Bergeron assisted in identifying speakers and presenting information about environmental impacts from port facilities on Great Lakes urban coasts. The 25 participants included Forum members, the Wisconsin DOT Harbors Assistance Program, the Great Lakes Ports Association Director, their consultant from Purdue University, USACE

and managers from the ports of Duluth-Superior, Green Bay, Milwaukee and Chicago. The GLPA Director briefed the group on their "Green Ports Initiative", a project to assess environmental concerns and pollution prevention practices at U.S. and Canadian ports and to develop a guidance manual for best management practices. Port managers discussed ongoing efforts to address pollution sources and we toured the port of Milwaukee. As a result, the Forum is working with the port of Muskegon to assess and implement an environmental management system that reduces nonpoint source and air pollution. During 2008, several meetings were held with facility managers and local officials, resulting in a Memorandum of Understanding to work together to implement best management practices. [A/AS-1 (work train)]

118 ALASKA: Alaska Sea Grant helped protect coastal water quality

Activity Summary: In 2000, MAP began a partnership with the Alaska Native American Fish and Wildlife Society (ANAFWS), with funding from the Environmental Protection Agency (EPA), to conduct a water quality training program in rural Alaska. The goal of the program was to develop water quality monitoring projects that meet the strict scientific rigor of the EPA Quality Assurance Project Plan (QAPP) protocols. MAP developed the curriculum, taught 60 percent of the course content, served as a technical advisor on several QAPPs. ANAFWS funding of this training program ended in 2007. However, MAP began collaboration with the University of Alaska Anchorage's Environmental and Nature Resources Institute, and developed a recertification class. EPA has authorized this recertification program, which is now taught to technicians needing recertification. To date, three recertification workshops have been held, one each in Anchorage, Bethel, and Dillingham. Impact Statement: People participating in this training developed 18 EPA-approved Quality Assurance Project Plans for their region, and were thus able to receive funding to employ a local tribal environmental coordinator. Twenty-seven technicians have been recertified by MAP. These efforts established a first line of defense to detect future water quality issues. Participants are now actively engaged in questioning activities that may potentially affect water quality in their communities and regions, and are actively educating others in their communities about water quality issues. The data collected by these monitors provide a baseline for detecting and tracking future water quality changes that may result from human and natural change. [ (wq train)]

277 ALASKA: Alaska Sea Grant helped coastal communities control invasive rats

Activity: (Johnson and Education Services) Alaska Sea Grant joined with the Alaska "Stop Rats" coalition to help control rats in Alaska's coastal communities. The coalition is composed of the U.S. Fish and Wildlife Service, Alaska Department of Fish and Game, National Oceanic and Atmospheric Administration, Shipping Safety Partnership, and others. Alaska Sea Grant published the award-winning book, Rat Control for Alaska Waterfront Facilities, authored by Johnson. Impact Statement: The Alaska Sea Grant publication Rat Control for Alaska Waterfront Facilities has been adopted as the in-house training manual by American Pest Control, the largest pest control company in Alaska. Impact Statement: Education Services created a Web site that featured information provided by MAP agent Terry Johnson on rat control, and links to authoritative sites. Alaska Sea Grant published and distributed 480 copies of the award-winning book, Rat Control for Alaska Waterfront Facilities, authored by Johnson, around the state to harbor masters, fish plant operators, and other managers of waterfront facilities. [ (inv train wq)]

1132 CALIFORNIA: California Beach Health

This project has already had important impacts for habitat monitoring on sandy beaches and for the involvement of a variety of stakeholders in management practices. The California Grunion is now considered a Species of Special Concern and the sandy beach is considered Essential Fish Habitat according to the Magnusson-Stevens Act, as interpreted by the National Marine Fisheries Service and the California Department of Fish and Game. Citizen scientists from coastal California have been trained and have provided extensive data for an understudied species, and their commitment has extended beyond this one species to a sense of stewardship for the coastal habitat. The National Marine

Fisheries Service- Southwest Region, Habitat Conservation Division has funded Grunion Greeter monitoring efforts in 2008 and plans to continue the work in future years. New management practices are in place throughout the habitat range of the grunion as a result of this work. The PI has evaluated habitat concerns for numerous agencies including California Coastal Commission, National Marine Fisheries Service, California Department of Fish and Game, Los Angeles Beaches and Harbors, California State Parks, the Goleta Beach restoration for the County of Santa Barbara, and ocean outlets in the County of Orange. The data were used in the assessment of the effects of the Cosco Busan fuel spill in San Francisco Bay. Numerous environmental organizations including Surfrider Foundation, Heal The Bay – Santa Monica, Santa Barbara Channel Keepers, and the Audubon Society are involved in grunion studies. Aquariums including Cabrillo Marine Aquarium, Birch Aquarium at Scripps Institution of Oceanography, the Roundhouse Aquarium in Manhattan Beach, the Aquarium of the Pacific in Long Beach, and the Ty Warner Sea Center of the Santa Barbara Museum of Natural History have grunion displays and programs as part of their mission. Several State Parks have initiated new public programs for grunion runs at their sites, including San Elijo State Beach, Bolsa Chica State Beach, Doheny State Beach, and Crystal Cove State Beach. Based on the efforts of the Working Group for beach managers and field operators, we are initiating the formation of a nonprofit organization. The focus will be to develop and disseminate best practices for beach management to balance wildlife conservation and recreation. [R/CZ-195 (mon end train)]

#### 268 HAWAII: Sea Grant establishes nearshore ecosystem restoration project in Waikiki

Hawaii Sea Grant initiated a multi-year project to work with the State Department of Land and Natural Resources, Waikiki Improvement Association, Waikiki Aquarium and other local partners to undertake a comprehensive restoration and maintenance of Waikiki Beach and the nearshore coral reef habitat. The project proposes to use periodic beach replenishment of “recycled” sand that is strategically removed from the nearshore coral reef. This activity may help to restore and maintain coral reef habitats that are presently buried in sand that has eroded offshore over decades of shoreline erosion activity. This beach replenishment effort would be combined with an education outreach program aimed at building awareness and stewardship among tourists, the local community, and key decision makers based on Hawaii Sea Grant's ReefTeach, ReefWatcher, ReefTalk and the Hanauma Bay Education Program. This would be a clear case of environmental restoration leading to economic, social, cultural and recreational opportunities. This project would also be a first, essential step in building an “aquarium without walls,” in which a natural coral reef ecosystem with its attendant community of fish and invertebrates would be a strong attraction for tourists and Hawaii residents, provide recreational business opportunities and demonstrate Hawaii's commitment to habitat restoration. Impacts: 1) Hawaii Sea Grant secured two years of funding from the Harold K. L. Castle Foundation in September 2007 to hire a project coordinator to establish local citizen and tourist engagement programs in marine stewardship. Hawaii Sea Grant also established a Memorandum of Agreement in February 2008 with the Waikiki Aquarium to coordinate, whenever possible, the activities of our ocean science researchers, extension professionals and educators toward the ambitious goal of restoring and maintaining Waikiki Beach and the nearshore coral reef habitat. Finally, Hawaii Sea Grant received a letter of endorsement from the Waikiki Improvement Association (WIA), a private, nonprofit organization dedicated to making Waikiki a great place to invest, work, live and play. In the letter, WIA stipulated that it will assist Hawaii Sea Grant in reaching its project goals by serving as a liaison and facilitator in developing collaborative partnerships among the various stakeholders including, but not exclusive to, businesses, the visitor industry, property owners, government, and residents. In addition, WIA is providing prime office space in the Waikiki

Trade Center for the Sea Grant Waikiki Coastal Coordinator. 2) Hawaii Sea Grant hired Jennifer Barrett in June 2008 to serve as the Waikiki Coastal Coordinator. The extension agent identified key stakeholders to engage and then held introductory meetings with them to invite their participation and seek their input on the project. The stakeholders included the Surfrider Foundation, Oahu Chapter, Waikiki Community Center, Hawaii Ecotourism Association, Interpret Hawaii, Honolulu Star-Bulletin (Susan Scott Ocean Watch columnist), The Nature Conservancy of Hawaii, Malama Maunalua, Hawaii Ocean Observing System (HiOOS), National Marine Fisheries Service Pacific Islands Regional Office, State Department of Land and Natural Resources (Office of Conservation and Coastal Lands, Division of Aquatic Resources, Artificial Reef Program, Aquatic Invasive Species Coordinator, Local Action Strategy Coordinators). The agent also participated in the U.S. Coral Task Force meeting held in Kona in August 2008 to network and identify potential project partners, engaging additional stakeholder groups, formalizing several more partnerships within the Waikiki community. 3) The agent also identified potential funding opportunities to support project activities in Waikiki and submitted grant proposals to these funding agencies. The agent was successful in securing funding from the Hawaii Tourism Authority's Natural Resource Program. This funding leverages existing extramural funds from the Harold K.L. Castle Foundation and are being directed to launch a community stewardship program entitled Reef Watch Waikiki in spring 2009. 4) In lieu of planning for a Waikiki ReefTalk program, the agent co-coordinated an Ocean Awareness Training program for over 100 participants in partnership with the NOAA Hawaiian Islands Humpback Whale National Marine Sanctuary and eight marine conservation organizations. The 15-hour training took place twice a week in November 2008 and involved the coordination of 15 cooperating agencies. Lecture topics covered included marine mammals, sea turtles, Hawaiian culture, oceanography and geology, Hawaiian reef organisms, coral reef biology and ecology, water quality and marine debris. Field projects included reef surveys, sea turtle and monk seal interpretation, and marine mammal data management. The training was offered free of charge, open to the public, and designed for volunteers who have an interest in working in marine education or tourism. Participants who complete the training received a CORAL (Care of our Culture, Reefs and Animal Life) certificate. [*(res edu train)*]

#### 1305 ILLINOIS/INDIANA: Sea Grant expands training and support for unwanted medicine collection programs

Prescription drugs often end up in wastewater treatment plants and can then contaminate waterways. IISG has developed a resource kit and held workshops to help communities starting unwanted medicine take-back programs. As a result of an IISG workshop and the program's resources, in Sangamon County, Illinois, approximately seven 55-gallon drums of household medicines were collected for safe incineration. Kendall County began an ongoing collection program--residents can drop off medicines at the police station any time. IISG is also co-sponsoring a two-county pilot mail back program with the Wisconsin Pharmaceutical Waste Working Group, a coalition of state and local officials, university extension, several companies involved in disposal, Milwaukee sewage specialists and others. This program, which will launch in 2008, is the first-of-its-kind-- individuals can call to request a mail back envelope to send in their unwanted medicines. IISG provided funding that has been used for graphic design, printing, student help, and other supplies that will be used to distribute information about this mail-back program. IISG has played key roles in the planning and ground work of this new program. [*A/ (train wq)*]

215 LAKE CHAMPLAIN: Sea Grant training increases law enforcement expertise relative to aquatic invasive species (AIS).

Statement: During the spring and summer of 2007, fifty three law enforcement officers (including VT State Police, NYSDEC Conservation Officers, and NYSDEC Forest Rangers) received training to assist them with various transport and possession regulations related to invasive species, during several workshops hosted jointly by VT/NY state agencies, Lake Champlain Basin Program and Lake Champlain Sea Grant. Impact: Ninety seven percent of the law enforcement personnel reported an increase in AIS identification skills as a direct result of training conducted by LCSG Specialist M. Malchoff. Ninety six percent of the VT State Police and 73% of the NYS DEC Conservation Officers indicated a 50% to 75% likelihood that they would implement this knowledge in the next 6-12 months. [*train inv*]

252 LAKE CHAMPLAIN: Sea Grant and USFWS workshop on invasive species recognition pays off years later

Focus Area: HEALTHY COASTAL ECOSYSTEMS NOAA SG Goal-Restored function and productivity of degraded ecosystems LCSG Goal - Restore coastal and aquatic ecosystems in the Lake Champlain basin. Objective - Prevent the introduction of new aquatic invasive (non-indigenous and nuisance) species (AIS) into Lake Champlain or the basin, slow the spread of existing AIS and mitigate their impact in basin waters. Sea Grant and USFWS workshop on invasive species recognition pays off years later. Early in 2003, LCSG, USFWS and USGS staff presented an aquatic invasive species workshop for law enforcement personnel charged with invasive species interdiction on the U.S. - Canadian border in the vicinity of Lake Champlain. The training paid off in August 2008, when a Canadian citizen declared her intent to transport a shipment of live fish into the U.S., including several Emperor snakehead (*Channa maruloides*). The entire shipment was seized. LCSG and local USFWS staff confirmed for USFWS law enforcement staff that the seized fish were in fact one of several species of snakehead listed as 'injurious,' under the provisions of the Lacey Act. Listed species may not be imported into the United States without a USFWS permit, who are reviewing the case for possible prosecution. [*A/M-1 (inv train)*]

495 LAKE CHAMPLAIN: Sea Grant helps businesses reduce phosphorous in stormwater runoff

Statement: Commercial landscapes account for significant proportions of total lawn area in impaired urban/suburban watersheds in the Lake Champlain Basin. Often ignored in NPS pollution reduction efforts, LCSG continues to work with managers of business and institutional properties to promote the adoption of low input/no phosphorous grounds care through one on one educational activities and technical support. Impacts: An August 2007 survey showed property managers participating in the Burlington pilot project (responsible for an estimated reduction in annual phosphorous loads in runoff of between .45 and .91 metric tons/yr.) were continuing low input practices after 3 years. Training and assistance provided to property managers lowered barriers to adopting or maintaining BMP for sustainable grounds care on over 128 acres (65%) of priority commercial/institutional lawn area in the Stevens and Rugg Brook watersheds in St Albans, VT. Reduced stormwater runoff volume, and reduced erosion and sediment transport were evident after the first season. Monitoring of runoff volumes, suspended sediment and phosphorous will quantify the impacts. [*mon train wq*]

566 LAKE CHAMPLAIN: Sea Grant rain garden education and demonstration projects improve water quality in VT urban areas

LCSG's Winooski Rain Garden Project trained city staff and led the city to adopt rain gardens and rain barrels on municipal property throughout the small (1 mi<sup>2</sup>), heavily urban former mill town. Impact: Measurements made at stormwater outlets after various levels of rainfall showed a significant reduction in stormwater volume discharging to Morehouse Brook, a stormwater impaired stream. Reductions in volume discharged ranged from over 70% in 1/8 inch rainfall to nearly 30 % in a 3 inch rainfall. *[A/M-1 (wq train)]*

1076 LOUISIANA: Nab the Aquatic Invader!

Teachers and students became aware of the problems aquatic invasive species pose on the environment and the economy and what they can about it. Teachers also reported that their students interacted with 780 people and exposed them to AIS information through presentations and showcasing their projects thus bringing a better understanding of AIS to themselves, their schools and their communities. *[E/ANS-03 (inv train)]*

119 MICHIGAN: Sea Grant Helps Baitfish Industry Cope with Deadly Fish Virus

In partnership with the Michigan Baitfish Association, Sea Grant developed model AIS-HACCP and biosecurity plans tailored to baitfish operations to prevent the spread of aquatic invasive species, notably Viral Hemorrhagic Septicemia (VHS). Since 2005, VHS has caused fish kills in the Michigan waters of northern Lake Huron, Lake St. Clair and the St. Clair River, and Lake Erie. Through Sea Grant workshops, 60 Michigan baitfish wholesalers and retailers were trained in AIS-HACCP procedures, allowing them to become certified as disease-free facilities by the U.S. Department of Agriculture's Animal and Plant Health Inspection Service, and to remain in operation. Certified VHS-free minnows are now widely available in Michigan bait shops. Further broadening program impact, Michigan Sea Grant presented the model AIS-HACCP and biosecurity plans to HACCP trainers in Wisconsin, Minnesota and South Dakota. *[ (inv fish dis train)]*

269 MICHIGAN: Sea Grant Outreach Contributes to AIS Policy Development

Staff members from Michigan's departments of agriculture, environmental quality and natural resources requested Michigan Sea Grant's assistance in developing a protocol to use in recommending additions and deletions from the state's new legislatively adopted lists of prohibited and restricted species. Sea Grant's stakeholder workshop discussions provided guidance for developing the listing and de-listing protocol and provided a basis for work on updating the state's Aquatic Invasive Species (AIS) management plan. *[ (train inv)]*

### 1367 MICHIGAN: Sea Grant's Aquatic Invasive Species Expertise Benefits Outreach Programs and Policy Development

State of Michigan agencies, Great Lakes regional commissions, federal agencies, organizations and institutions recognize and value Sea Grant's research based contributions on aquatic invasive species (AIS) issues and seek Michigan Sea Grant's counsel and collaboration on significant efforts. In 2006-07, the Department of Environmental Quality asked Michigan Sea Grant to develop materials, conduct training and provide support for a boater education program called Clean Boats, Clean Waters (CBCW). During the two year pilot program, Michigan's CBCW volunteers made more than 2,000 personal launch site contacts with boaters, almost all of whom responded favorably to the message. In 2006-2007, staff members of Michigan's departments of agriculture, environmental quality and natural resources requested Sea Grant's assistance with developing a protocol to use in recommending additions to/deletions from the state's new legislatively adopted lists of prohibited and restricted species. Sea Grant's stakeholder workshop discussions provided guidance for developing the protocol and provided a basis for work on updating the state's AIS management plan. *[A/FP-1 (train edu inv)]*

### 253 MINNESOTA: Sea Grant Aquatic Invasive Species Prevention Training Helps Businesses, Changes Federal and State Policies

The Aquatic Invasive Species-Hazard Analysis and Critical Control Point program (AIS-HACCP), a Great Lakes Sea Grant Network Program led by Minnesota Sea Grant to prevent the spread of AIS by the aquaculture and baitfish industries, led to an estimated 1,035 plans put in place by businesses and agencies. These plans, similar to the HACCP system used by the seafood industry to minimize seafood consumption health risks, address points in the fish and bait handling business that are critical for AIS contamination or release. Over 540 private, state, and federal fish producers from at least 16 states and the Province of Ontario are trained to used AIS-HACCP methods. About 20% conducted their own workshops, training an additional 2,260 people. Workshop participant evaluations show that 90% think AIS-HACCP training is effective. Over 60% became aware of new risks they posed for spreading AIS, which indicates the project had a significant impact on participants' knowledge and awareness. AIS-HACCP training led the Minnesota Department of Natural Resources (DNR) to change regulations for harvesting baitfish in designated infested waters of two important harvest areas: Mille Lacs Lake and the Rainy River. The DNR allowed bait harvesters and their helpers to harvest out of Mille Lacs Lake (which had become infested with Eurasian watermilfoil) if they were trained in the AIS-HACCP process. Later, when zebra mussels were found in the lake, an AIS-HACCP-like approach allowed for harvest when risks were acceptable. When the Rainy River was infested with spiny waterfleas, the DNR allowed for baitfish harvest after harvesters attended AIS-HACCP training. Other important impacts: 'ç The U.S. Fish and Wildlife Service Sea Lamprey Control Program developed a AIS-HACCP team to address disease issues related to the transfer of sea lampreys around the Great Lakes for sterile male releases. 'ç The Indiana DNR developed a plan for their fish management and research fisheries survey activities. 'ç The Illinois Environmental Protection Agency developed and implemented AIS-HACCP plans. 'ç By 2010, all 2,000 bait producers in Ontario, Canada, will be required to have training and have a plan in place. 'ç Participants from South Africa intend to conduct training workshops in their country. *[A/P-1 (inv train dis)]*



230 NEW JERSEY: NJ Sea Grant Improves Recycling in the Recreational Boating Industry

Hundreds of tons of shrink wrap are used every year in New Jersey to protect boats during the harsh winter season. To reduce the amount of shrink wrap that ends up in landfills, the New Jersey Sea Grant Extension Program and the New Jersey Department of Environmental Protection (NJDEP) Coastal Management Office partnered to increase the number of shrink wrap recycling locations, and to launch an education and outreach effort to promote recycling shrink wrap and other materials used to store and maintain boats. The number of disposal options/locations has increased by 20 for a total of 29. According to marine supply businesses, marinas and other boating businesses in New Jersey, approximately 450,000 pounds of shrink wrap is purchased annually and approximately 300,000 pounds or 66% was recycled in 2006 with an additional 7% increase to 330,000 pounds recycled in 2007. As a result of the education and outreach effort approximately three recycling businesses have been able to expand their client base. *[A/SGEP-1 - A/S-1 (wq train)]*

232 NEW JERSEY: Sea Grant Develops Education to Improve Recycling in the Recreational Boating Industry (2008)

(2008) New Jersey Sea Grant Extension Program and the New Jersey Department of Environmental Protection (NJDEP) Coastal Management Office partnered to increase the number of shrink wrap recycling locations and, launch an education and outreach effort to promote recycling shrink wrap and other materials used to store and maintain boats. This initiative was made possible by a grant from the BOAT NJ Program. As a direct result of this effort the number of shrink wrap disposal options has been increased from six to twenty nine and the amount recycled has increased from approximately 36% to 75% *[A/SGEP-1 - A/S-1 (wq train)]*

528 NORTH CAROLINA: Rocky Branch project continues

Through stream and estuarine restoration projects, more than 400 school children, college students and working professionals have been exposed state-of-the-art restoration practices focused on restoring urban streams. In addition, 1000 feet of Rocky Branch were restored using natural channel design, 15,000 square feet of accessible floodplain area was created and 235 feet of creek was daylighted. Five stormwater outfalls were equipped with boulder step dissipating structures, 2000 feet of greenway trail developed, including 220 feet of boardwalk suspended above the newly created floodplain and two new bridges across the creek. Habitat for fish and macroinvertebrates was enhanced and streambank erosion and subsequent downstream sediment loading was reduced. Food and cover for urban wildlife was improved by introducing native fruit and nut producing vegetation and shrub vegetation. *[A/EA-10 (wq res train)]*

254 OHIO: Sea Grant helps prevent the spread of aquatic invasive species

Ohio Sea Grant, working through the Great Lakes Sea Grant Network, conducted AIS-HACCP workshops to train live fish handlers and aquatic equipment operators in techniques to avoid spreading aquatic invasive species through their operations. Impact: At least 225 handlers and operators received AIS-HACCP certification in eight workshops held in Ohio, Michigan, Indiana, New York, Florida and Ontario.

State and provincial fisheries regulators have acknowledged the usefulness of AIS-HACCP in that no further fish handling restrictions based upon AIS have been issued. [A/EP-1 (*inv train*)]

#### 255 OREGON: Oregon Sea Grant Pilot Project Brings About AIS Monitoring Protocols

A lack of AIS protocols posed both a serious potential problem for spreading AIS into Oregon's healthy watersheds. For Sea Grant it was an opportunity. OSG developed trainings, guides and monitoring and reporting protocols. The US Forest Service and the USDI BLM Aquatic and Riparian Effectiveness Monitoring Program (AREMP) from California to Washington tested our protocols during the summer of 2007. The evaluation and success of the program has resulted in a formal adoption of an expanded AIS monitoring protocol into all of the agencies aquatic monitoring programs from British Columbia border to Point Reyes, California. This is seen as model by the multi-agency PNAMP, (Pacific NW Aquatic Monitoring Program) responsible for coordinating aquatic health monitoring for natural resource agencies in the NW. These monitoring efforts will not just help in early detection, but also help in preventing further movement and allow for effective control and prevention programs to minimize the impacts from aquatic invasive species. [A/ESG-7 (*inv train mon*)]

#### 256 OREGON: Oregon Sea Grant A Major Player in Spreading the Word on Aquatic Invasives

When Oregon Sea Grant embarked on the journey to protect Oregon's waterways from nasty aquatic invasives we had no idea of the momentum and interest that would build as awareness of the issue and the battle cry of partners took hold across the state and nation. From the schoolteachers who 'humanely released' classroom specimens like the rusty crayfish into local waters, to the classroom supply houses that shipped aquatic invasive critters to teachers nationwide; from the recreational stream fisherman to the US Forest Service fire fighter who had no clue their boots could spread the New Zealand Mudsnail in Oregon's waterways-- a change is happening. A crusade to educate and take action is spreading nearly as fast as the invasives! Partners are numerous -- government and non-government agencies, institutions, watershed councils, teachers, pet stores, recreationists, environmentalists, college to grade school students and general citizens. We have had to reprint thousands of Oregon Sea Grant-created posters, brochures, and publications due to the demand. Requests for the 'do not release' brochure and poster for classroom AIS are used not only in Oregon, Washington and California but Arizona, Iowa, Louisiana, Illinois and Florida. The New Zealand Mudsnail Prevention publication has been reprinted and distributed in Scotland, Canada and New Zealand. Early impacts are occurring. Classroom students recognized that rusty crayfish were being used in their classrooms; teachers no longer release the animals but are using the situation as learning opportunities to research the species and learn about the impacts of invasives; and new classroom curriculum is being developed on invasives. The mudsnail prevention guides used by fly-fishing clubs in public events resulted in early detection in the Tillamook Bay area allowing agencies to post signs and prevention information to minimize further spread. The US Forest Service reports they developed region-wide protocols for their fire personnel using the prevention guide. And, Oregon's Invasive Species Council reported that 'None of the organisms on the 100 worst list became established in Oregon in 2007.' A result that Oregon Sea Grant and its partners hope to repeat in 2008's report. [A/ESG-7 (*inv train edu edu*)]

264 OREGON: Fish Habitat Restoration Prioritization Protocols Taking Hold

Many watershed councils and management agencies previously lacked coherent fish habitat restoration plans and failed to prioritize restoration projects based on clear and logical rules, resulting in some publicly-funded projects making little difference in fish habitat availability or quality. This led Guillermo Giannico, Oregon Sea Grant's (OSG) fisheries extension specialist, to take the lead in developing a prioritization of restoration actions protocol. He worked with several partners to organize and develop workshops and seminars on the prioritization methods applicable to restoration work and he produced manuscripts and peer-reviewed publications on the subject (for example, Beechie, T., G. Pess, P. Roni, and G.R. Giannico. 2008. Setting river restoration priorities: a review of approaches and a three-step process for identifying and prioritizing actions. *North American Journal of Fisheries Management* 28:891–905). This topic has continued to attract the interest and attention of an increasing number of groups as they attend and participate in OSG demonstration projects, training workshops, and presentations around the state. Giannico has accepted several invitations to present on this topic, including two from the University of British Columbia, Canada, and his abstract for an oral presentation was accepted at the 4th International Conference on River Restoration (June 16–21, 2008, Venice, Italy). After Giannico trained the Luckiamute Watershed Council in this prioritization protocol, the council used it as the template for developing its own Action Plan. North coast partners indicated a heightened interest in the prioritization protocol from other northern coastal watershed councils, and several watershed council coordinators requested that OSG begin planning for a regional workshop, involving NOAA staff, on stream assessment, restoration prioritization, and monitoring, to be delivered in late 2009. [ *fish res ebm train*)]

237 TEXAS: Texas Sea Grant supports private partnerships in and sponsorships of environmental protection programs (2008)

After completing its transition to an industry-managed model as prompted by Texas Sea Grant's marine business specialist, the Clean Texas Marina Program is much less dependent on ongoing federal and state funding and is expected to have less difficulty attracting marina participation now that a regulatory agency is not a principal in the program, thus increasing the number of marinas and boaters in Texas who adhere to best environmental practices. During the reporting period, five additional marinas became certified under the program, three marinas were recertified and three new marinas pledged to participate; more than half of these were after the change to the industry-managed model. [ *A/F-1 (train wq)*]

238 TEXAS: Texas Sea Grant promotes public participation in environmental protection programs (2008)

As an adjunct to the Clean Texas Marina Program and also administered by the Texas Sea Grant marine business specialist, the Clean Texas Boater Program continued to promote environmentally sound practices to individual boaters in Texas. The program solicited an additional 1,000 recreational boaters pledging to support clean water in Texas during the reporting period, bringing the total membership up to 3,500. The program has been adopted by several clean marina programs in the country, including Maryland, Virginia and Mississippi/Alabama potentially expanding knowledge of and participation in clean boating practicing exponentially. [ *A/F-1 (train wq)*]

240 TEXAS: Texas Sea Grant leads effort to remove monofilament line from the environment (2008)

Volunteers in the ongoing Monofilament Recovery and Recycling program continued to collect monofilament fishing line from recycling bins and send it in to be recycled. The program strives to increase public awareness of the impact to wildlife and property by improper disposal of monofilament fishing line into the environment. A total of 118 pounds of monofilament line was collected and sent to be recycled during the reporting period. *[A/F-1 (wq train)]*

241 TEXAS: Texas Sea Grant restores marshlands (2008)

Texas Sea Grant's Jefferson and Chambers counties coastal and marine resources extension agent conducted 18 field laboratory experiences for 411 adults and 21 field labs for 645 young people for a total of 4,224 contact hours. The trips were aboard the Waterborne Education Center boats on the Trinity River out of Anahuac. Funding came from various source, primarily grants procured by WEC. During two youth and one adult field trips conducted by the agent, the groups restored wetlands by planting one half acre of marsh in the Trinity Bay System. *[A/F-1 (train edu edu res)]*

242 TEXAS: Prairie wetland restored at Sheldon Lake State Park (2008)

The Texas Sea Grant Wetland Restoration Team completed the very successful prairie wetland complex restoration at Sheldon Lake State Park, where about 8 acres of former agricultural lands were restored using new aerial photography methodology. The team planted between 5,000 and 7,500 plants, which have since flourished and now completely dominate the entire 8 acres. This project will have a direct impact on improving runoff water quality in the upper Galveston Bay and will provide habitat for waterfowl in the area. The project will have significant impact through the entire region because it has demonstrated how historical aerial photographs can be used to enhance the chances for restoration success. *[A/F-12 (res train wq)]*

245 TEXAS: Wetlands guidebook used as reference for site restoration, marketing strategy (2008)

The Coastal Communities Development Specialist's book, 'Texas Coastal Wetlands Guidebook,'<sup>9</sup> was used as a reference to support the restoration, beginning in December 2007, of Pine Brook Wetlands, one of three remaining prairie pothole wetlands that are accessible to the public in the Houston area. The book, which cited the location, has been credited with aiding fundraising for the project, in which \$12,000 in donations was raised and 80 volunteers donated 2,000 hours to the project, and with providing background research that facilitated the successful restoration. More than 3,000 invasive species were removed and 1,800 native plants reintroduced to the site. The Pine Brook Wetlands Restoration Project includes two prairie pothole/marshes totaling 13 acres that has had up to 4,000 migrating birds at a time stop over for a few weeks or months on an annual basis. *[A/F-12 (train res)]*

247 TEXAS: Texas Sea Grant promotes public participation in environmental protection programs (2009)

As an adjunct to the Clean Texas Marina Program and also administered by the Texas Sea Grant marine business specialist, the Clean Texas Boater Program continued to promote environmentally sound practices to individual boaters in Texas. The program solicited an additional 1,000 recreational boaters pledging to support clean water in Texas during the reporting period, bringing the total membership up to 3,500. The program has been adopted by several other clean marina programs in the country, including Maryland, Virginia and Mississippi/Alabama. [A/F-1 (train wq)]

248 TEXAS: Texas Sea Grant mobilizes volunteers to expand environmental education and habitat restoration (2009)

Six Coastal and Marine Resource (CMR) Agents identified, recruited and trained 86 interns through the Texas Master Naturalist (TMN) program. The TMN program's mission is to develop a corps of well-informed volunteers to provide education, outreach, and service dedicated to the beneficial management of natural resources and natural areas within their communities. Upon certification, these 86 interns joined a cadre of 508 master volunteers overseen by the CMR agents, contributed more than 54,000 hours of volunteer service, the equivalent of 26 full-time employees (GAO), whose time is valued at more than \$1.1 million (independent sector). These Master Naturalists accounted for 36,334 educational contacts to students and teachers through in-school and after-school projects and trainings, and the general public through workshops on EarthKind Landscaping and rainwater harvesting. They also assisted in habitat restoration projects ranging from staking 7,000 recycled Christmas trees on the beach to help rebuild sand dunes, to planting more than 2,500 native marsh, wetland and prairie plants in wildlife refuges. Other projects included repairing state parks damaged by Hurricane Ike and conducting sea turtle patrols in order to locate and mark the nests of these endangered species. Advanced training for some included a 'Keys to Successful Presentations,'<sup>2</sup> which taught the basics of public speaking to large audiences. Six of six (100%) reported they "probably will or definitely will" deliver public seminars as a result of the training. [A/F-1 (train res end)]

249 TEXAS: Texas Sea Grant removes monofilament line from the environment (2009)

Volunteers in the ongoing Monofilament Recovery and Recycling program continued to collect monofilament fishing line from recycling bins and send it in to be recycled. The program strives to increase public awareness of the impact to wildlife and property by improper disposal of monofilament fishing line into the environment. A total of 141.9 pounds of monofilament line was collected and sent to be recycled during the reporting period "" an increase of 20 percent over 2007. Estimating line strength at 12 pound test (common for coastal Texas), this 141.9 pounds corresponds to a distance between 225.7 and 378.9 miles (roughly the distance between Houston and New Orleans). This brings the total pounds reported collected to 440.9 pounds since 2004 (the first year of records). [A/F-1 (train wq)]

1602 WASHINGTON: Sea Grant leads efforts to enhance environmental benefits of Puget Sound commercial and recreational shellfish harvests

In south Puget Sound, Washington's top molluscan shellfish production area, Sea Grant recruited and trained volunteers to remove debris, reclaim acres of tidelands and improve availability of clams and oysters for public harvest. Tribal, state agency and shellfish industry partners joined with Sea Grant and dozens of community volunteers in workshops, field trips and enhancement activities to provide additional public shellfish resources and increase shellfish filtration of the Sound. Impact: Fifteen acres of shellfish beds have been restored and are now more accessible to the public and tribal harvesters. The shellfish industry and shoreline homeowners are better educated to deal with water quality issues, and some have decided to upgrade their septic systems. *[A/FP-7 (train res wq edu)]*

1607 WASHINGTON: Sea Grant Offers Homeowners Simple Techniques to Reduce Nutrient Loading into Hood Canal

Hood Canal is experiencing low dissolved oxygen levels partly due to excess nitrogen in the ecosystem, resulting in fish kills and other changes to the local ecology. Sea Grant is training homeowners to install simple kitchen sink screens that trap food waste and reduce introduction of nitrogen into septic systems that drain into Hood Canal. Impact: Over 2,000 homeowners now use these devices, preventing an estimated 1.5 tons of nitrogen from being introduced into Hood Canal. *[A/FP-7 (train wq)]*